

Specifications

SAFETY CARTRIDGE

Background of the Invention

1. Field of the Invention

This invention is a safety cartridge which permits the firearm owner to quickly use his loaded firearm for self defense or police action but prevents discharge of his firearm by unauthorized persons. The safety cartridge is quickly ejected (pistol, rifle, or shotgun) or moved out-of-line (revolver) by the firearm owner before defensive gun use. A criminal or child attempting to fire the gun, however, initiates the safety cartridge which jams the gun rendering the gun completely inoperable. Removing the fired safety cartridge requires significant time and skill of the gun owner. The safety cartridge does not damage the firearm.

2. Description of Related Art

Firearms are used for self defense and police actions to prevent crimes as well as for sport such as hunting and target practice. A responsible hunter or target shooter keeps his firearms unloaded in a locked cabinet with ammunition stored separately in a second locked cabinet. Self defense or police actions, however, requires immediate access which implies a loaded firearm near by. For example, a loaded pistol on the night stand is 100% useful for self defense and 0% safe. Conversely, the same pistol locked in a cabinet with no ammunition available is 0% useful for self defense but 100% safe. A loaded firearm with a safety cartridge in the gun chamber is nearly 100% useful for self defense and nearly 100% safe. The reality is that many firearms for self defense and police action are kept in a loaded and easily available condition. There have been many studies conducted which tend to justify keeping a loaded weapon available.

The Lott - Mustard study based on FBI crime data from 1977-1992 showed that violent crime rate goes down by approximately 25% within 6 years after adoption of Right To Carry Laws (from just under 400 to less than 300 incidents per 100,000 population). Thirty-five (35) states in the US now have Right To Carry Laws (up from only 9 states in 1986).

Right To Carry is:

- more cost effective than adding more police or prisons
- presents no risk to law enforcement (law abiding citizens are not the problem)
- benefits women, the aged, the handicapped, as well as able bodied men

A review of "Guns and Self Defense" by Gary Kleck, PhD, copyright 1997 shows that there are at least 2.55 million incidents of defensive gun use per year in the US (probably much more because adolescents were not counted). Defensive gun uses are 3 to 4 times more common than crimes committed with guns. Defensive gun use significantly lowers victim injury (17%

vs. 33%) and property loss (31% vs. 65%). Civilian gun ownership and defensive gun use deters violent crime. Police can only investigate a crime after it has occurred police can't/don't prevent crime. Only 3% of defensive gun use involves anyone being wounded and most of these wounds (85%) are nonfatal. Most defensive gun use involves just a warning ("I've got a gun") or firing a warning shot. A majority of gun owners (62%) plan to use their gun for protection as well as for sport and half of these owners keep at least one gun loaded and ready (mainly in the bedroom). Keeping a loaded firearm seems justifiable in America based on the statistic that 83% of Americans will, sometime during their life, be a victim of a violent crime. The mobster, Sammy (The Bull) Gravano, once called gun control activists "the best friends a crook ever had 'cause guys like me will always get a gun."

The US Constitution Second Amendment and the current position of the United States Justice Department (John Ashcroft under President George W. Bush) gives individuals the right to own a gun and 70% of the states (35 states) have Right To Carry Laws. Most gun owners have a gun for self defense as well as for sport and 31% of all gun owners keep a gun loaded and ready. The police always keep their guns loaded and ready. Of approximately 600,000 police officers in the US, an average of 68 are killed each year and 8 of those (12%) with their own weapon (most taken from holster or squad car). A loaded firearm with a safety cartridge in the chamber is very effective for self defense and is nearly 100% safe the 8 police officers killed with their own firearm would probably be alive today if they used the safety cartridge in the chamber of their loaded gun. The safety cartridge would also prevent gun owners from being killed with their own weapon.

There are more firearms privately owned today than at any time in US history, and the number continues to rise. Data recently released by the National Center for Health Statistics show that there were fewer firearm-related deaths in the US in 1999 than any year since 1971, with drops in each category of death - suicide, murder, and accident. Fatal firearm accidents have steadily declined from over 3100 in 1930 to only 824 in 1999 even though our population more than doubled from 123 million (1930) to almost 273 million (1999). Fatal firearm accidents for children accounted for 88 of the 824 total in 1999 a decrease of 84% since 1975. The significant reductions cited above result from people being more careful due to publicity on the misuse of firearms, better safety training, and better gun design. Introduction of my safety cartridge would reduce accidental firearm deaths further specially among children who find a loaded gun in their house because pulling the trigger would cause the gun to jam. A gun owner who chooses to use the safety cartridge in his loaded weapon must train periodically so he doesn't attempt to defend himself using his weapon with it in the chamber causing his gun to jam. Training should always be done with the gun selected for self defense and include practice on a range.

A patent search was conducted on the Internet using the US Patent and Trademark Office web cite, www.uspto.gov. Patents issued between 1790 and 1976 were searched using current US classifications (CCL) for firearm safety and locking mechanisms. Patents issued after 1976 (which accounts for 40% of all patents issued in the US as of mid 2003) were searched using key words and combinations of words existing in the patent text and title. These methods produced nearly 1400 "hits". Some of these "hit" groupings contained the same patent number. References cited in patents similar to my safety cartridge were also reviewed. More than 850 patents ended up being looked at in my search. Most were not related to my safety cartridge and involved lock boxes, display rack locks, trigger locks, holster locks, firing pin locks, hammer

locks, electronic devices activated by magnetic ring, devices requiring gun modifications, etc. The resulting search produced 14 patents dated from 1863 to 2002 as on page 1 of this patent. These 14 patents are compared to my safety cartridge which is called the "JamIt Safety Cartridge" in TABLE 1.

Referring now to TABLE 1, the first patent on a safety device occupying the chamber of a gun was issued during the Civil War in 1863 to Bonzano (37,946). It was a chamber plug inserted down the tube of a muzzle loaded cannon to prevent unauthorized loading and firing of the cannon. Comparisons of the 14 patents to my "JamIt" safety cartridge can easily be made by examining TABLE 1. Many of the devices take too much time to use and thus ineffective in self defense situations (see column 7 of TABLE 1). These include Achee et al. (6,408,556), Scott (6,237,272), Samuels (6,041,536), Ross (5,950,344), Briley et al. (5,475,994), Honey et al. (5,171,924), Mikus (5,052,142), Thurber (4,783,924), and Bonzano (37,946) devices. JamIt can be used to provide safety in loaded pistols, revolvers, rifles, and shotguns (see column 5 and 6 of TABLE 1) while most of the other patented devices are generally effective for handguns or a specific handgun (pistol or revolver but not both). Only Scott's (6,237,272), Stuart's (5,394,635 and 5,347,739), and Horton's (5,010,674) safety cartridges have the potential to be used in loaded rifles and shotguns. Scott's device is a simple plug fitted with o-rings and is not effective for revolvers. The purpose of Scott's device is to prevent a customer in a store (where a gun is on display) from inserting a live round of ammunition into a gun, i.e., it is very difficult to remove Scott's plug and therefore not effective for loaded firearms to be used for self defense. Horton's device appears to be limited to revolver use only.

The 7th, 8th, and 9th columns of TABLE 1 show that JamIt along with Trois et al. (6,418,654), Stuart (5,394,635 and 5,347,739), Horton (5,010,674) and Giles (3,208,176) devices are quick to operate in a self defense situation, jam the gun if an unauthorized person seizes and attempts to fire the gun (pulls trigger) and once the gun is jammed, it's difficult to remove the obstruction (barrel tool required). These five safety cartridges basically meet the self defense safety objectives in different ways. The Trois device is rated only "Fairly Quick" (column 7 of TABLE 1), i.e., the gun owner must pull the device from the barrel and then chamber a live round of ammunition (pistol only, not double action revolver). Also the Removal after Activation (see column 9 of TABLE 1) is rated "easy-Perhaps too easy. Child could pull out and fire a revolver." If the Trois device was placed in the wrong gun (say a pistol with a long barrel), then live ammunition could be chambered and an attempt to fire the pistol would cause the barrel to blow up! Horton's and Giles devices appear to be limited to revolver use only. Most military and police officers use pistols rather than revolvers. The other two devices, JamIt and Stuart's safety cartridge, use live primers (see column 14 of TABLE 1) to activate the jamming function and can only be used once as shown in column 10. Both JamIt and Stuart's safety cartridges are activated by firing pin impact (primer initiation) causing the handgun (revolver or pistol) to jam. Both safety cartridges can be readily and quickly removed or by-passed by the gun owner who is familiar with his weapon and the purpose of the safety cartridges.

There are significant differences between the Stuart safety cartridge and the JamIt safety cartridge. When the primer is initiated by the firing pin, the Stuart projectile which is longer and bigger in diameter than the JamIt slug is arrested by the gun barrel rifling becoming wedged in the barrel while still being held by the special cartridge case. The JamIt slug is connected to a standard cartridge case by an extension spring. The slug is smaller in diameter than the Stuart projectile and

moves freely down the barrel after primer initiation. Slug movement is stopped after several inches of travel by the resistant force applied by the extension spring whose elastic limit is exceeded, i.e., the extension spring becomes in effect a compression spring. The resulting fired cartridge is typically 5 inches long for a .45 Colt Commander semiautomatic pistol causing the slug to extend slightly beyond the gun muzzle. For most handguns, the JamIt slug remains in the barrel near the muzzle end. This depends on the gun caliber and barrel length along with other factors. The fired JamIt cartridge can be removed and the pistol unjammed using a cylindrical rod (pencil) inserted in the muzzle end of the barrel. This rod can be used to push the slug down the barrel. The cartridge case is then ejected through the pistol breech by pulling on the pistol slide action. Once the cartridge case is free of the chamber, it may be gripped by the pistol owner and the cartridge case, compression spring and slug is pulled out through the breech. The fired Stuart safety cartridge may be removed and the pistol unjammed by inserting the cylindrical rod down the barrel through the muzzle and pushing very hard to overcome the engraving force on the projectile telescoping the projectile back into the special cartridge case and then ejecting the cartridge assembly through the pistol breech by pulling on the pistol slide action. A similar action on the part of the gun owner is required to unjam a revolver rather than a pistol, i.e., the rod is used to push against the JamIt slug (or Stuart projectile) telescoping the slug (projectile) back into the cartridge case until the tip of the slug (projectile) aligns with the forward surface of the cylinder allowing the cylinder containing JamIt (or Stuart safety cartridge) to be moved out of line with the barrel and removed causing the revolver to be unjammed.

In Stuart's most recent patent (5,394,635) for automatic Colt pistols, the long projectile is propelled into and wedged in the barrel by the resultant primer and gun powder gases when initiated by an unauthorized person pulling the trigger. The short cartridge case may be ejected by the unauthorized person by pulling on the slide action leaving the projectile stuck in the barrel. The wedged projectile prevents further live ammunition from being chambered causing the Colt pistol to be jammed. A safety problem could occur if the projectile is propelled too far down the barrel allowing a live round to be chambered and fired with the obstruction (projectile) in the barrel. This can never happen with the JamIt safety cartridge where the slug is firmly connected to the cartridge case with the compression (extension) spring.

The JamIt safety cartridge is more producible and uses standard rather than special cartridge cases and a much simpler projectile (slug). A simple extension spring anchors the projectile (slug) to the cartridge case using a standard 0.0625 inch spring steel roll pin which is pressed into the side of the cartridge case. The JamIt safety cartridge is simpler, lower in cost, more reliable and safer than the Stuart safety Cartridge. The force relationships for deformation of an extension spring into a compressed spring is a much more repeatable event than the force relationships involved in deformation of an oversized projectile in a rifled barrel. Projectile final position in the barrel is dependent on exact projectile diameter, barrel inside diameter and rifling dimensioning, projectile material as well as primer (and gun powder if required) pressure. Early tests on concepts similar to Stuart's projectile design produced significant variability in projectile position in the barrel after prime initiation. Tests on the JamIt extension springs produced very repeatable spring deformation and therefore projectile position within the barrels of various handguns such as the .45 Colt Commander pistol, .45 Colt Gold Cup pistol, 9mm Beretta Mod 92FS pistol, .357 Smith & Wesson double action revolver, and .357 Ruger Blackhawk single action revolver

with long (6") barrel. The gun owner also has the option of installing the standard o-ring to the slug on the JamIt safety cartridge making it much more difficult to remove after firing it and therefore more safe the choice is his!

Some people may prefer to defend themselves in their home with a rifle or shotgun. JamIt can easily be adapted for use with these weapons. A small propellant charge in addition to the primer may be required for the longer extension spring. A longer spring will result in a longer fired safety cartridge (maybe 10 to 20 inches long) after JamIt initiation assuring that an unauthorized person can't unjam the longer firearm by removing JamIt. The projectile press fit force may not be sufficient using the Stuart safety cartridge as indicated in footnote (1) in TABLE 1. The unauthorized person could generate significantly more extraction force in a bolt, lever, or pump action rifle or shotgun than in a pistol slide action. The length of the fired Stuart safety cartridge is limited to only about 1.5 times the unfired Stuart safety cartridge by the basic concept design. Fired JamIt safety cartridge length is not limited.

In summary, JamIt and Stuart's (5,394,635 and 5,347,739) safety cartridges are the only cartridges activated by firing pin impact on a live primer. Primer initiation in the JamIt and Stuart safety cartridge cause the firearm to be jammed rendering it completely inoperable. Both safety cartridges can be readily and quickly removed or by-passed (revolver) by the gun owner in a self defense application. There are, however, significant differences between Stuart's device and the JamIt safety cartridge; namely:

- JamIt can be used to provide safety to pistols, revolvers, rifles and shotguns.
- JamIt contains an extension spring which is transformed into a very long compression spring when initiated.
- JamIt's slug (projectile) moves freely in the barrel and is not a press fit like the Stuart device.
- The gun owner is given the option of installing an o-ring to the JamIt slug which provides for a press fit of the slug in the barrel making it much more difficult to remove if the JamIt is fired by a child playing with the owners gun, i.e., the o-ring provides more safety and would probably require a gunsmith to remove the fired JamIt safety cartridge!
- The fired JamIt safety cartridge length can be increased from the current 3"-5" to 10", 20", or longer by changing the number of spring coils to assure gun jamming action. The fired length of the Stuart safety cartridge is limited to about 1.5 times the length of the unfired safety cartridge.
- No dangerous barrel obstructions are possible with the JamIt safety cartridge. An obstruction (projectile) in the barrel is possible with Stuart's device if the projectile is propelled to far.
- The JamIt safety cartridge is easily identified by the gun owner as a safety cartridge with its red anodized aluminum or white plastic (Delrin) slug and bent spring nose, i.e., the JamIt safety cartridge is "flagged" for identification but the Stuart safety cartridge is not its important that the gun owner be able to distinguish the safety cartridge from live ammunition.
- JamIt uses more low cost standard and common components and is more producible. Four (4) of JamIt's 6 components are standard components (primer, cartridge case, pin and o-ring). Only the slug and spring must be made special.

Description of Drawings and Preferred Embodiments

I claim priority of my Provisional Utility Patent on my safety cartridge which was submitted to the US Patent and Trademark Office on August 1, 2002 and officially recorded as Application Number 60/400.855, Conformation No. 9832, and Filing Date 08/05/2002.

A sectioned view of my safety cartridge 10 for a 9mm Luger type semi-automatic pistol such as a 9mm Beretta 92FS pistol is illustrated in FIG. 1. The safety cartridge consists of a standard number 100 small pistol primer 1, a standard 9mm Luger cartridge case 2 which has been cross drilled to accommodate a standard type 420 stainless steel 1/16" x 1/2" tension pin 3, a customized extension spring 4 which has been electroless nickel plated to prevent corrosion, and a slug 5 (projectile). The spring 4 contains a double coil 6 on one end which is soldered or spot welded or silver soldered together for additional strength. The spring 4 double coil 6 may be further strengthened by inserting a steel washer between the double coil followed by dipping the double coil end into a solder bath. The safety cartridge 10 is held together by the spring 4 double coil 6 attached to the pin 3 and cartridge case 1 and slug 5 with its bent end 8. The safety cartridge 10 is placed in the chamber of a loaded firearm and may be ejected or by-passed by the gun owner if defensive gun use is required. FIG. 2 and FIG. 3 show the elongated condition of the safety cartridge after initiation and after removal from the gun.

FIG. 4 is a loaded 9mm pistol 30 comprising a spring loaded hammer 31, slide 32, barrel 33, bore 34, chamber 35, frame 36, trigger 37, magazine 38 and handle portion 39. An attempt to fire the pistol 30 by an unauthorized person initiates the safety cartridge 10 causing the resulting primer 1 gases to propel the slug 5 down the gun barrel 33 several inches until the slug 5 is arrested by action of the extension spring 4 which is attached to both the cartridge case 2 by means of the pin 3 and slug 5 by means of the bent end 8 of the spring 4. The safety cartridge 10 has now expanded into and occupies the bore 34 of the pistol 30. Live ammunition 20 contained in the magazine 38 can not be cycled into the gun chamber 35 because the elongated safety cartridge 10 occupies the chamber 35 and bore 34 causing the pistol 30 to jam. The gun owner may remove the fired safety cartridge 10 by removing the loaded magazine 38, pulling the slide 32 rearward and then gripping the cartridge case 2 and pulling it out of the breech with the deformed compression spring 4 and slug 5 attached.

FIG. 5 is a sectioned view of my .38 Special safety cartridge 10A for a .38 Special or .357 Magnum revolver. It contains identical components to the 9mm safety cartridge shown in FIG. 1 except for the .38 Special cartridge case 2A. The .38 Special slug 5 shown in FIG. 5 has the same dimensions as the 9mm slug shown in FIG. 1.

FIG. 6 shows a portion of a .357 Magnum or .38 Special revolver 40 comprising a cylinder 41, chambers 42, barrel 43, bore 44, and frame 45. An attempt to fire the revolver 40 by an unauthorized person initiates the safety cartridge 10A causing it to expand into the bore 44 jamming the revolver 40 by preventing cylinder 41 rotation so that the live ammunition 20A cannot be aligned with the barrel 43. The gun owner may remove the fired safety cartridge 10A from the revolver 40 using the following procedure:

1. Using a wooden pencil, push against the slug 5 and bent end 8 of the spring 4 until the slug 5 enters the cartridge case 2A. This action is facilitated by the chamfer 7 on the rear end of the slug 5 allowing the spring 4 loaded slug 5 to enter the cartridge case 2A.
2. Continue pushing the slug 5 into the cartridge case 2A until the bent portion of the spring 8 aligns with the parting surface between the chamber 42 and barrel 43.
3. At this point, the cylinder 41 which contains several chambers 42 containing the compressed fired safety cartridge 10A and live ammunition 20A may be moved out-of-line with the barrel 43 and frame 45.
4. Once the cylinder 41 is out-of-line, the fired safety cartridge 10A may be removed.

FIG. 7 is a sectioned view of my .45 ACP safety cartridge 10B for semi-automatic pistols such as a Colt .45 ACP Gold Cup, a Colt .45 ACP Lightweight Commander, a .45 ACP AMT Backup, or other .45 ACP pistols and revolvers. It contains identical components to the 9mm safety cartridge 10 (FIG. 1) except for the number 150 large pistol primer 1B, .45 ACP cartridge case 2B, and slug 5B.

FIG. 8 is a sectioned view of my 30-06 safety cartridge 10C for a 30-06 rifle. It contains identical components to the 9mm safety cartridge 10 (FIG. 1) except for the number 103 rifle primer 1C, 30-06 cartridge case 2C, and slug 5C.

FIG. 9 is a sectioned view of my 12 gauge shotgun safety cartridge 10D for a 12 gauge Remington Model 870 pump (or other) shotgun used for hunting, trap shooting, and law enforcement. Since the output of a shotgun primer 1D (such as the Federal number 209A primer) is significantly higher than small and large pistol primers and rifle primers, a larger pin 3D and spring 4D must be used to withstand the higher pressures. Tests showed that a 1/8" diameter (vs 1/16") pin 3D and a spring 4D with 34 coils (vs 20 coils) works okay and results in a fired safety cartridge length near 10 inches versus about 3-5 inches for 9mm, .38/.357, and .45 ACP fired safety cartridges. The 12 gauge safety cartridge 10D also requires a larger cartridge case 2D and slug 5D to fit the larger shotgun.

FIG. 10 is a sectioned view of my alternative Preferred Embodiment .38 Special safety cartridge. It is similar to FIG. 5 except it contains an o-ring 12E on the slug 5 and a standoff tube 11E between the spring 4 and slug 5. The standoff tube 11E was found to be required for the .38 Special safety cartridge so that its overall length meets overall length requirements of 1.550" max. specified by gun and ammunition manufacturers. A standoff tube 11E was not required for my 9mm Luger safety cartridge 10 shown in FIG. 1 or my .45 ACP safety cartridge 10B shown in FIG. 7. Use of a standoff tube for the 30-06 safety cartridge 10C shown in FIG. 9 may be desirable from a producibility / low cost standpoint because its made from low cost plastic tubing and it allows for much shorter slugs [5C (FIG. 8) and 5D (FIG. 9)].

During safety cartridge development, it was decided to machine o-ring grooves in all the slugs for 9mm Luger safety cartridges (slug 5 in FIGS. 1 - 4), .38 Special / .357 Magnum safety cartridges (slug 5 in FIGS. 5 and 6), .45 ACP safety cartridges (slug 5B in FIG. 7), 30-06 safety cartridges (slug 5C in FIG. 8) and 12 gauge shotgun safety cartridges (slug 5D in FIG. 9). These Preferred Embodiment safety cartridges and safety cartridges of other caliber's such as .380 Auto, .40 S&W,

10mm Auto, .44 Remington Magnum, etc. would all be equipped with slugs containing an o-ring groove. O-rings would be provided in the Preferred Embodiment safety cartridge packaging with instructions giving the gun owner the option of installing the o-ring to his safety cartridge. The instructions would state:

"If you elect to install the o-ring to the slug of your safety cartridge, the fired safety cartridge would be much more difficult to remove from your gun and may even require the services of a gunsmith. Using the o-ring improves safety further. It would be nearly impossible for a child or other unauthorized person who has not read the instructions to remove the fired JamIt safety cartridge equipped with the o-ring. The o-ring causes the slug to be stuck in the barrel. Considerable force (up to 100 pounds and more depending on lubrication, interference and rubber hardness) must be applied to the slug to move it out of the barrel."

The JamIt safety cartridge is packaged with the o-ring separated from the cartridge. If the gun owner decides he wants the increased safety of an o-ring equipped safety cartridge, he would then choose to install the o-ring himself. He would have only himself to blame if he is forced to employ a gunsmith to clear the fired JamIt safety cartridge from his jammed firearm. If he decides against employing the o-ring, it would be much easier to clear the fired JamIt safety cartridge from his weapon but less safe. It is very probable that in either case, clearing the weapon of a fired JamIt safety cartridge will never need to be done the need arises only if some unauthorized person tries to fire his gun. One JamIt safety cartridge should last the gun owner a lifetime since its very unlikely it would ever be used. It should also be emphasized that a fired JamIt safety cartridge does not damage the firearm in any way.

In summary, safety cartridges are presented for 9mm, .38 Special, .357 Magnum, and .45 ACP semi-automatic pistols and revolvers and bolt action, lever action, pump, or semi-automatic 30-06 rifles and 12 gauge shotguns. Safety cartridges for other popular caliber firearms can easily be developed and produced. Most of the safety cartridge parts are low cost and standard (primer, pin, cartridge case and o-ring) or common (same spring was common to safety cartridges for all handguns and rifles had to be lengthened for the 12 gauge shotgun because of increased primer gas output). The slugs were made from red anodized aluminum or white lightweight plastic (Delrin) so the gun owner could visually identify the safety cartridge from live ammunition. Extensive testing on lightweight slugs (vs heavy brass slugs) showed that fired safety cartridge elongation is doubled to about 5 inches in pistol and revolver applications assuring a jammed and safe firearm. Longer fired safety cartridge elongation (7 to 10 inches) was observed for rifles and shotguns due to longer cartridge length and a longer spring specified for shotguns.